

**Bonneville Power Administration
Fish and Wildlife Program FY98 Watershed Proposal Form**

Section 1. General administrative information

Title **Warm Springs Reservation 1998 Watershed Enhancement Project**

Bonneville project number, if an ongoing project 8028

Business name of agency, institution or organization requesting funding
The Confederated Tribes of the Warm Springs Reservation of Oregon

Business acronym (if appropriate) CTWSRO

Proposal contact person or principal investigator:

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Subcontractors.

Organization	Mailing Address	City, ST Zip	Contact Name
Salmon Corps	PO Box C	Warm Springs, OR 97761	Zach delNero

NPPC Program Measure Number(s) which this project addresses.

Measures: 7.6A.1., 7.6A.2, 7.6B.1, 76B.3, 7.6B.4, 7.6B.6,

NMFS Biological Opinion Number(s) which this project addresses.

Other planning document references.

Project is consistent with: Wy Kan Ush Me Wa Kush Wit, The Integrated Resources Management Plan of the Confederated Tribes of the Warm Springs Reservation of Oregon, and the Deschutes River Subbasin Plan (NPPC, 1991). Project is supported by

the Confederated Tribes of the Warm Springs Reservation of Oregon, the Mutton Mountain Grazing District and private landowners, the Bureau of Indian Affairs, Natural Resources Conservation Service, the Deschutes Resources Conservancy.

Subbasin.

Deschutes Subbasin, (Warm Springs River and Shitike Creek subwatersheds)

Short description.

Protect and enhance key habitat for anadromous and resident fish using passive techniques and continue collecting information on habitat quality and stock status in tributaries to the Deschutes River.

Section 2. Key words

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction	X	Watershed
*	Resident fish		O & M	*	Biodiversity/genetics
	Wildlife		Production		Population dynamics
	Oceans/estuaries		Research	*	Ecosystems
	Climate	*	Monitoring/eval.	*	Flow/survival
	Other	X	Resource mgmt		Fish disease
			Planning/admin.		Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

Other keywords.

water quality improvement, water optimization, riparian protection, habitat inventory, passage monitoring, monitoring and evaluation, evaluation of hatchery-wild interactions.

Section 3. Relationships to other Bonneville projects

Project #	Project title/description	Nature of relationship

Section 4. Objectives, tasks and schedules

Objectives and tasks

Obj 1,2,3	Objective	Task a,b,c	Task

1	Reduce riparian usage from livestock by 30 % and protect streambanks in reaches of Eagle, Nena Creeks, the Deschutes and Warm Springs River by installing a deep solar well at 4 Corners to encourage better livestock utilization of the target grazing areas.	a	Work with tribal Range and Agriculture Department staff and the local grazing groups to site and design deep solar well.
		b	Purchase material (see section 7f)
		c	Construct well (see section 7e)
		d	Implement monitoring and evaluation activities (condition trend plots and photo points - CTWSRO will fund)
2	Reduce riparian usage by livestock by 25-30% and protect streambanks in reaches of the Warm Springs River and Beaver Creek by installing a deep solar well at “the island area” to encourage better livestock utilization of the target grazing areas.	a	Work with tribal Range and Agriculture Department staff and local grazing groups to site and design deep solar well.
		b	Purchase materials (see section 7f)
		c	Construct well (see section 7e)
		d	Implement monitoring and evaluation activities (condition trend plots and photo points - CTWSRO will fund)
3	Protect sensitive areas from livestock grazing on Lower Eagle Creek, Lousy Hollow Creek and Skookum Creek by constructing miles of riparian fence to improve riparian vegetation and increase bank stability to improve juvenile fish rearing habitat.	a	Coordinate with grazing districts/landowners to design fence.
		b	Prepare contract
		c	Implement fencing contract
		d	m&e, photo points

4	Inventory anadromous and resident fish habitat in 55 miles of Beaver Creek and its tributaries.	a	Prepare contract with ODFW for habitat inventories.
		b	Conduct habitat inventories (see section 7e
		c	Receive final report.
5	Collect and analyze life history information on anadromous and resident fish in Shitike Creek (add to assessment)	a	Construct weir & counter (BPA fund) and install rotary screw trap (CTWSRO will fund)
		b	Count and sample fish at trapping sites
		c	Collect juvenile fish information at rotary screw trap
		d	Conduct spawning ground surveys for spring chinook salmon, summer steelhead and bull trout.
6	Provide coordination of activities, administrative oversight and assist in implementation of project.	a	Assist in implementation of project objectives.
		b	Provide coordination with other ongoing watershed restoration efforts on the Reservation and within the Deschutes Basin.
		c	Assist tribal staff in objective implementation and report the monitoring and evaluation activities.
		d	Provide coordination with other CTWSRO watershed enhancement activities in the ceded lands.

Objective schedules and costs

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	1/1998	12/1998	20.00%
2	1/1998	12/1998	20.00%
3	1/1998	12/1998	27.00%
4	1/1998	12/1998	6.00%

5	1/1998	12/1998	15.00%
6	1/1998	12/1999	12.00%
			TOTAL 100.00%

Schedule constraints.

Excessively cold or wet weather conditions could effect the start date of objectives 1, 2 & 3. Water flow levels will dictate when implementation of objective 4 can begin.

Completion date.

12/1998

Section 5. Budget

FY99 budget by line item

Item	Note	FY98
Personnel		\$50,800
Fringe benefits		\$11,684
Supplies, materials, non-expendable property		\$130,100
Operations & maintenance		\$ 0
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		\$35,000
PIT tags	# of tags:	\$ 0
Travel		\$2,500
Indirect costs	41.4%	\$80,764
Subcontracts		\$81,000
Other		\$ 0
TOTAL		\$391,848

Outyear costs

Outyear costs	FY99	FY00	FY01	FY02
Total budget				
O&M as % of total				

Section 6. Abstract

The CTWSRO is proposing to implement BPA funded watershed enhancement activities on the Reservation in conjunction with activities funded by CTWSRO and other entities. Objectives include water developments and fencing to exclude livestock from streams and

data collection to provide information to ongoing assessments of watershed health. BPA would fund 78% of watershed activities for 1998, with 22% funded by CTWSRO, NRCS, EPA and other entities.

The project will benefit native populations spring and summer/fall chinook salmon, summer steelhead, Pacific lamprey, rainbow trout, bull trout and other resident fish species in the Warm Springs, Eagle and Skookum sub-watersheds. The Warm Springs River and Shitike Creek, support the only naturally spawning population of spring chinook salmon in the Deschutes River. No hatchery produced fish are allowed to spawn above the weir at rivermile ten.

Solar deep wells and riparian enclosure fencing have proven to be effective at minimize grazing impacts in riparian zones on the Warm Springs Reservation. Currently streams in the project area suffer from grazing impacts such as lack of vegetation, eroding soils, unstable streambanks and extreme temperature fluctuations. By reducing the impact from grazing the riparian area will stabilize over time and should require no further intervention.

An adult fish weir in Shitike Creek and aquatic habitat inventories are proposed to further gain information on fish populations and habitat quality in streams on the Reservation. This information will be used with existing evaluations of watershed health and ongoing evaluations such as the CTWSRO funded EDT process.

Section 7. Project description

a. Technical and/or scientific background.

The Deschutes Basin is the second largest watershed in the state of Oregon. The most recent and definitive water quality study in the Deschutes Basin is a collaborative effort between the Confederated Tribes of Warm Springs and the Environmental Defense Fund (EDF). The study indicates there are environmental problems in the basin that effect natural resources, the quality of life and the economic future of the basin (EDF, 1995). The study shows that environmental conditions reflect that natural resources are used in the basin extensively for irrigation, grazing forestry hydropower generation, urban developments and recreation. Water quality varies in the Deschutes from pristine to degraded, with some areas experiencing high water temperatures.

As a natural system, watersheds can and do recover form the effects of management activities. However, if activities are crowded together in time and space, natural recovery cannot keep pace. A Cumulative Impact Analysis Methodology has been developed in order to match the timing of management activities with those of the natural system. A threshold value estimating a watershed's capacity to withstand management activities without incurring significant damage from a major storm event has been determined for most watershed on the reservation. The cumulative runoff acreage (CRA) is a value that

measure the percentage of compacted soil, bare ground the impacts of management. Higher values indicated greater impacts have occurred in the recent past. Most watersheds have a CRA threshold of 25 percent, but those containing highly erosive soils may have a threshold of 20 percent. This methodology is used on the Reservation to monitor cumulative effects, and to assess a watershed's stability and capacity to recover from planned management activities. In watersheds where the current CRA value exceeds the designated threshold value, actions have been taken to mitigate degraded areas. This may include road and skid trail eradication, erosion-control seeding and project delays deemed necessary to bring CRA values below threshold within a reasonable time frame. Information gathered while monitoring parameters indicated all reservation streams meet the chemical water quality standards adopted in the Tribal Water Code. Temperatures, however exceed required standards for many weeks during the late summer and early fall months. Sediment and turbidity levels are also a problem in streams with unstable banks within the Warm Springs River watershed, especially during runoff events. Current CRA values for segments of Warm Springs River range from 7.2 in lower reaches to 26.4 in the upper reaches. CRA values for Beaver Creek and two of its main tributaries range from 21.3 % to 30.5%. CRA values have not been calculated for Eagle and Nena creeks but the threshold values are 20% due to highly erosive soils and resource managers expect that the current CRA values exceed the threshold due to severe impacts from grazing. Unstable streambanks are common in the lower reaches of both streams and temperatures exceed standards (IRMP, 1997).

The CTWSRO recognizes the need to balance resources by integrating workable solutions that maintain watershed health . To provide the Deschutes basin with a watershed management framework, the CTWSRO are implementing the Ecosystem Diagnosis and Treatment (EDT) process for the Deschutes basin. The EDT. EDT is an applied ecosystem analytical tool that integrates existing information on environmental conditions with natural life cycles (anadromous and resident fish) by stream reach and life stages methodology (Lastelle, 1996). The EDT method is a science-based approach to analyzing data and actions to maintain or improve the production of fish resources. Initial results are expected in 1999.

The only remaining naturally spawning populations of spring chinook salmon in the Deschutes River are in the Warm Springs River and Shitike Creek located on the Warm Springs Reservation. Protection and restoration of habitat in these areas is critical to maintaining these native populations. In addition, native populations of summer/fall chinook, summer steelhead, bull trout, Pacific lamprey, mountain whitefish, sculpin spp, chiselmouth, dace spp rainbow trout and other resident fish are located in streams on or adjacent to the Warm Springs Reservation and will benefit from the proposed objectives. The CTWSRO is interested in protecting habitat for all fish populations as they all play a role in the ecosystem and in tribal culture.

Eagle and Skookum creeks are perennial tributaries to the Deschutes River that support populations of summer steelhead, redband trout and other resident fish species. Riparian fences are proposed for the lower two miles of Eagle Creek and the lower ½ mile

of Lousy Hollow Creek, a tributary to Eagle Creek. Fences are also proposed for four miles of lower Skookum Creek and along one mile of the Deschutes River at the confluence with Skookum Creek. Exclusion of livestock will allow natural re-establishment of vegetation. This will stabilize the banks against erosion, filter and reduce sediment and nutrient loading to the streams, reduce water temperature by shading the stream and improve habitat for anadromous and resident fish species and wildlife dependent on riparian plants.

b. Proposal objectives.

Objective 1: Reduce riparian usage by livestock by 25-30% and protect streambanks in Eagle and Nena creeks by installing a deep solar well at Four-Corners to encourage better livestock utilization of the upland grazing areas.

Deliverables/results: A deep solar well will be constructed at Four Corners. Monitoring and evaluation activities will be initiated and reported at the end of the contract period. Labor and monitoring and evaluation will be funded by CTWSRO at an in kind value of approximately \$24,500.

Objective 2: Reduce riparian usage by livestock by 25-30% and protect streambanks in the Warm Springs River and Beaver Creeks by installing a deep solar well at “The Island” to encourage better livestock utilization of the upland grazing areas.

Deliverables/results: A deep solar well will be constructed at “the island”. Monitoring and evaluation activities will be initiated and reported at the end of the contract period. Labor and monitoring and evaluation will be funded by CTWSRO at an in kind value of approximately \$24,500.

Objective 3: Protect sensitive areas on Lower Eagle Creek, Lousy Hollow Creek and Skookum Creek by constructing 7.5 miles of riparian fence to improve riparian vegetation and increase bank stability to improve juvenile fish rearing habitat.

Deliverables/results: 7.5 miles of riparian fence will be constructed to protect streamside vegetation along Eagle, Skookum creeks and the Deschutes River. Spawning ground surveys will be conducted by CTWSRO.

Objective 4: Continue efforts begun in the Warm Springs River watershed to collect information on anadromous and resident fish habitat in tributaries of the Warm Springs River.

Deliverable/results: A contract will be established with ODFW (Aquatic Inventories Project) to inventory 55 miles of tributaries to the Warm Springs River. A final report detailing the results will be provided to CTWSRO by ODFW that will present the information collected in summary and graphic form as well as specific reach data. A grant from the Environmental Protection Agency will be used to fund \$10,000 of this objective.

Objective 5: Establish an adult trapping facility and collect life history information on

anadromous and resident fish in lower Shitike Creek and incorporate this information with other assessment data on the watershed.

Deliverable/results: Trapping sites will be established in Shitike Creek and will be used to collect life history information on spring chinook salmon, summer steelhead, Pacific lamprey, rainbow trout, bull trout and other resident fish species. The information will be presented in a final report. CTWSRO in kind for this objective will be approximately \$32,200.

Objective 6: Provide coordination of activities, administrative oversight and assist in implementation of project.

Deliverable/results: Coordinate and implement all objectives of the project.
Prepare project informational reports and final report of accomplishments.

c. Rationale and significance to Regional Programs.

This project is consistent with all known tribal and federal laws. This project is consistent with several areas of the NPPC's Fish and Wildlife Program, and the sponsors submit it as a watershed project that will benefit both anadromous and resident fish. Specifically it is consistent with Section 6 of the Fish and Wildlife Program that calls for watershed based habitat restoration focusing on protection of wild and natural populations.

The project will compliment other past and ongoing watershed restoration work in the Deschutes River. The CTWSRO, Oregon Trout, Bring Back the Natives (Trout Unlimited), the Environmental Protection Agency (EPA), the Natural Resources Conservation Service (NRCS), private landowners and others have been working together, in some cases for several years, to improve watershed health on the Reservation. The CTWSRO have also been working with ODFW, the Deschutes River Conservancy, several watershed councils, private landowners and others on restoration efforts for the Deschutes River.

Efforts to assess the subwatersheds on the reservation and the health of the Deschutes River have been underway since the mid 1980's. The Natural Resources Department of the CTWSRO has several on-going methods for assessing watershed health.

In 1986 the Warm Springs Tribal Council adopted Resolution 7410 (Ordinance 74) that called for an integrated planning approach to natural resource management. An Integrated Resource Management Plan (IRMP) for the Forested Area of the reservation was implemented in 1992 and the IRMP for the Non-forested and Rural Areas is currently under public review. The IRMP provides management direction for natural resources on the Reservation and establishes resource goals, objectives and desired future conditions. It also established standards and best management practices for management.

Since 1992 the CTWSRO has collaborated with the Environmental Defense Fund to promote sustainable development and the protection of ecosystems in the Deschutes River Basin, with an emphasis on water and fisheries resources. In 1995, CTWSRO and EDF

prepared “Restoring the Deschutes River” which presents research and analysis to document environmental conditions and trends in the Basin, focusing on instream flows and water quality. The document presents solutions that emphasize cost-effective measures and broad-based participation of the regions residents and resource users. It is likely that the project benefits would persist over the long-term as management direction established by Warm Springs Tribal Council continues to promote watershed protection and restoration in the basin.

Objective 1&2: The CTWSRO has implemented solar water developments similar to those proposed with great success. These types of project are proving to be an effective way of reducing riparian grazing and are cost-effective with very low maintenance costs. Rather than band-aid the streambanks with riprap or other methods, we propose to address the issues that lead to degradation. Tribal cost share of objectives 1 & 2 is approximately \$49,000.

Objective 3: Riparian fencing in lower Eagle, Nena and Skookum creeks, tributaries to the Deschutes River containing naturally producing summer steelhead, will eliminate grazing pressure and allowing for natural recovery of riparian vegetation. No other restoration activities for these streams are proposed at this time. The CTWSRO believes that rest and natural recovery for grazing-impacted streams is the most cost-effective means to restoration.

Objective 4: Habitat inventories using the Aquatic Inventories Project methodology (ODFW) began on the Warm Springs River in 1997. Continuing these efforts will give assess habitat quality and identify areas and issues that can be addressed in future decisions by resource managers. A grant from the Environmental Protection Agency will fund \$10,000 of the costs of this objective.

Objective 5: Shitike Creek contains spring chinook salmon, summer steelhead, Pacific lamprey, bull trout and many other resident fish. Although some distribution and abundance information is known, more information on adult fish migration timing and origin and juvenile outmigration is needed. A significant number of out-of-basin summer steelhead stray into the Deschutes River. It is unknown if the stray steelhead are successfully spawning in the mainstem and tributaries of the Deschutes River. Operation of an adult fish weir will provide valuable information on the origin of fish that enter the Shitike Creek. Information collected will be used to determine the spawning success rate of stray summer steelhead in Shitike Creek and the Deschutes River. The data will be used for management decisions regarding stray and natural populations in the basin.

Objective 6: Project objectives will need to be coordinated with local grazing and other community groups and data collected will need to be analyzed and reported in a timely manner. This objective will allow this work to be accomplished.

d. Project history

BPA funded work began in 1981 and continued through 1990 (project #81-108). Work included riparian fencing and instream work (log weirs, boulder placement, juniper revetment) Monitoring and evaluation of this work funded by BPA continued through 1990 (Fritsch, 1995). Monitoring and evaluation is ongoing and funded by the CTWSRO.

This project encompassed 26 km of key anadromous habitat on the Reservation.

Tribally funded restoration work began in the mid-1980's and included fencing, road eradication, seeding and planting, and streambank stabilization.

Additional BPA funded habitat restoration began in 1996 with the funding of the Early Action watershed projects. Efforts resulted in 11 miles of riparian fencing along the Deschutes River and 7.4 miles of the Warm Springs River. Seven solar pumps with troughs have been installed along Deschutes and Warm Springs River in association with the riparian fences. A monitoring and evaluation program was also initiated in 1996. Aerial photogrammetry of streamside vegetation will be used to determine vegetation recovery and the improvement of streambank stability in a section of the Warm Springs River that was fenced to exclude cattle. Funding for continuation of this work will be required at year five and ten after the cattle are excluded for riparian protection (1997).

Other restoration efforts on the Warm Springs Reservation include a three phase restoration program in the Seekseequa Creek Watershed funded by the NRCS through the Environmental Quality Incentive Program to bring the watershed within CRA values. This project will fund road eradication, fencing and seeding with native grasses. GWEB, EPA, Bring Back the Natives, Oregon Trout, Bureau of Indian Affairs and others have contributed funds for riparian fencing, solar water developments and instream enhancement work that will benefit anadromous and resident fish by improving water quality and fish habitat.

e. Methods.

Methods to implement the on-the-ground objectives will consist primarily of passive restoration techniques. The CTWSRO believes that long term solutions will provide the most benefit to the resources and community. The work will be accomplished through combination of activities such as livestock exclusion and water developments. Over time, the removal of livestock will lead to recovery of riparian plant communities and an increase in bank stability..

Objective 1 and 2:

Two solar deep wells and pipeline/trough delivery systems will be designed and sited by staff from the Department of Natural Resources, BIA and NRCS. One solar deep well will be located at Four Corner, near Simnasho, Oregon. The other will be located in a flat bench between the Warm Springs River and Beaver Creek canyons. Criteria for site selection include its having a water table at a reasonable depth, underutilized upland vegetation, its accessibility by livestock and its visibility from road. Minimal visibility from roads will reduce the incidence of vandalism. Cultural resource values in the area of the deep wells will be assessed by a tribal archeologist (funded by CTWSRO).

The main solar panel for each deep well system will consist of an array of 24 individual

solar panels that each produce 15 volts of Direct Current (DC) during peak hours. A DC/AC inverter will convert the DC voltage into AC voltage. The inverter will also provide automatic controls to the system if the system experiences fluctuations in power levels and protects the pump against dry-running. Five 300 gallon troughs will be placed strategically across the range area to provide water to different portions of the pasture. Each trough can be individually turned on or off, thus regulating the movement of stock to target specific pastures at specific times to minimize the need for livestock to move into streamside areas. Construction of the deep solar well pumps will be provided and funded by the CTWSRO.

Monitoring and evaluation of objective 1 and 2 will include range and riparian condition and trend measurement and photo points. Methods for measuring range and riparian condition and trends will include visual foliage cover estimations and Daubenmire cover measurements. (Smith, 1989 unpublished report). These methods establish plots on the surface of the ground in riparian and range areas and estimate species composition, and percent ground cover of various types of vegetation. Over time changes in species composition and percent cover will be recorded.

Results expected: Each deep solar well will be capable of pumping 5-10 gallons per minute to 5 separate water troughs during the months of May -November. The Four Corners system will provide water to approximately 300 head of livestock and the Island system will provide water to approximately 200 head of livestock. Development of these systems will encourage utilization of target grazing areas and reduce the use of riparian areas by livestock, thus enhancing fish habitat. The CTWSRO has utilized these wells in the past and have been able to demonstrate a 60 percent decrease in riparian foraging (Smith, 1992 unpublished report).

Objective 3:

Riparian fences will be built on the lower two miles of Eagle Creek and the lower ½ mile of Lousy Hollow Creek, a tributary to Eagle Creek. Fences will also be built along four miles of lower Skookum Creek and along once mile of the Deschutes River at the confluence with Skookum Creek. Exclusion of livestock will allow natural re-establishment of vegetation. This will stabilize the banks against erosion, filter and reduce sediment and nutrient loading to the streams, reduce water temperature by shading the stream and improve habitat for anadromous and resident fish species and wildlife dependent on riparian plants.

Final agreement and siting of the fences with the Mutton Mountain Grazing group and private landowners will be pursued after funding is secured. A contract with a fencing crew will be developed to follow NRCS specifications. Upon completion of each fence, project personnel and tribal staff will perform a final inspection of each fence.

- A. “H” braces on each corner of boundary and at ¼ mils locations along fence. Brace posts should be creosote treated with a minimum diameter of 5”. Brace posts should be set solidly in the ground at a minimum depth of 30”

- B. Steel posts should be spaced 16.5 feet apart.
- C. Two wire stays should be placed between each post.
- D. Wire spacing should have a height minimum and vertical spacing of 16"-10"-10"-10".

Objective 4:

Habitat inventories (ODFW , modified Hankin and Reeves methodology) began on the Reservation in 1996 with 30 miles of the mainstem Warm Springs River inventoried. Beaver Creek, a key anadromous fish spawning and rearing stream and its tributaries are proposed for 55.2 miles of survey in 1998.

Stream surveys will be conducted using methods described in Moore, Jones, and Dambacher (1995). The collection and analysis of the stream survey information is based on a hierarchical system of basins, streams, reaches and habitat units. The survey teams collect field data based on stream, reach and habitat units. The field data focuses on channel and valley morphology (stream and reach data), riparian characteristics and condition (reach data) and instream habitat (habitat unit data).

Crews will survey the streams by walking the stream from mouth to headwaters. The stream surveys are organized by reach and channel units. Reaches vary in length from as short as 1/2 kilometer to more than 8 kilometers and are defined by channel and valley geomorphology, gradient, land use, riparian characteristics and stream flow. The channel is classified into 22 hierarchically organized types of pools, glides, riffles, rapids, steps and cascades. The crews estimate the length and width of every habitat unit. At every unit, attributes are estimated or measured to describe gradient, substrate, woody debris, shade, features of instream cover and bank stability.

Habitat features are summarized by stream, watershed and basin. The data will be compiled into a comprehensive database that describes key attributes of instream habitat, riparian structure and channel morphology. The survey data will be dynamically segmented in a geographic information system (ArcInfo) onto a 1:100,000 scale digitized stream layer to display habitat features and combinations of habitat features relative to location of streams, reaches and habitat units in the watershed. The information can be used to describe current status of habitat throughout the basin and the potential to support fish populations. The data sets can also be used for developing restoration strategies that target stream reaches, streams and watersheds.

Objective 5:

A picket weir and trap will be installed in the lower mile of Shitike Creek. Installation will occur in March or when spring water levels allow for installation. Monitoring will consist of reviewing videos of fish passing the facility and by manual operation of the trap for sampling.

Weir and trap will be operated daily as weather and water conditions allow. Sampling will include fish species identification, measuring, weighing, identifying fin marks, and

collecting scale samples and snout samples on fish trapped. Initial permission to use the preferred trapping site has been received. Final permission and siting will occur in early 1998.

A rotary screw trap will be operated in the lower one mile of Shitike Creek. Installation will occur March when weather and spring water levels allow safe operation. The trap will be operated and catch sampled daily. Sampling will include fish species and fin clip identification, measuring and weighing, collecting scale samples, and collecting whole fish or tissue samples for genetic analysis. Permission has already been received for the trap to be placed and operated. The tribal in-kind cost share for this task will be approximately \$16,900 for the first year. Results expected include collection of life history information for spring chinook salmon, summer steelhead, Pacific lamprey, rainbow trout, bull trout, large and coarse scale suckers, mountain whitefish, sculpin spp, and other resident fish species.

Spring chinook and summer steelhead spawning ground surveys will be conducted. The lower 12 miles of Shitike Creek will be surveyed by walking and visually identifying redds. The number of redds per index area along with water and air temperature and any other noteworthy items will be recorded. Spring chinook spawning ground surveys will be conducted in September and summer steelhead spawning ground surveys will be conducted in May.

From this objective, run timing and emigration numbers will be estimated. This information in conjunction with spawning ground survey information will be used to estimate juvenile production, estimate pre-spawning mortality and to identify key spawning areas.

f. Facilities and equipment.

Objective 1 and 2:

A solar GRUNDFOS pumps, driven by solar energy will be acquired for each site. The pump are completely manufactured of stainless steel and the pump and motor are water lubricated. A pressure tank will be added on the mainline of each water delivery system to protect the pump from surges in line pressure and to moderate pressure within the delivery system. A reverse pressure switch will be added to the mainline near the wellhead to shut the pump down when maximum line pressure is obtained. A one inch PVC pipeline will be installed as the mainline. Five 300 gallon troughs will be placed strategically across the target range area and each trough will have a one inch ball valve so that each trough can be individually turned off. Each trough will be made of heavy gauge steel to resist vandalism and will be painted black to absorb solar energy to prevent freezing. A concrete pad will be poured for the housing for the pumping unit. The housing will be constructed of plywood and dimensions will be approximately 16'x32'.

Objective 3:

Standard fencing material for a 5 strand barbed wire fence will be acquired.

Objective 4:

No special equipment needed.

Objective 5:

Adult fish trapping: A picket weir made of steel piping and aluminum sheet metal will be manufactured. The fish trap will be constructed to allow for sampling and manual operation. Standard waterproof video equipment will be purchased along with a standard video monitoring system. The video monitoring system will allow fish identification and counting but will not interrupt the fishes migration. A cost share option with a computer technology firm (Intel) will be pursued in 1998 to acquire a computer-video editing system.

Juvenile fish trapping: The CTWSRO will provide a five foot rotary screw trap for lower Shitike Creek and cables for securing the trap in place.

g. References.

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- Smith, 1990. Condition and Trend Measurement Methodology, Warm Springs Indian Reservation. Department of Natural Resources Department Document. Warm Springs, Oregon.
- Smith 1992. Making Water While the Sun Shines: Utilizing solar energy for livestock water developments. Natural Resources Department Document, Warm Springs, Oregon.

Section 8. Relationships to other projects

This project does not conflict with any other under the NPPC Fish and Wildlife Program.

The IRMP I and II, Lower Deschutes Management Plan, the Tribal Restoration Plan, EDF Report and the Deschutes Subbasin Plan all identify the need for enhancing water quality and riparian habitat within the Deschutes watershed. Objectives, 1,2,3 are on-the –ground objectives selected to address the concerns of water quality and riparian habitat.

Objectives 4 and 5 address the need for additional information that are needed to complete ongoing assessments of watershed health (CRA, EDT process, IRMP I and II).

Efforts to restore watershed health in the Deschutes River. Cooperative efforts between many federal, state and private entities are key to success of the efforts. The CTWSRO is currently working to restore watershed health with: Americorp, The State of Oregon, Oregon Trout, Bring Back the Natives (Trout Unlimited) Deschutes Resources Council, 5 active sub- watershed councils, NRCS, Wasco SWCD, USFS, BLM, PGE, and private landowners.

Section 9. Key personnel

Project contact:

Patty O'Toole

Duties include project administration, planning, design, implementation, coordination and monitoring and evaluation.

B.S. Zoology, Oregon State University, area of emphasis: Organismal Biology, 1989

Employed by the Confederated Tribes of the Warm Springs Reservation of Oregon.

Eight years in fisheries management, project planning and implementation (production, management and habitat). Lead preparer for the Hood River Production Project Master Plan, Master Agreement and Environmental Impact Statement. Contributor to IRMP I and II.

Other project personnel will be assigned/hired/contracted when contract is established with BPA.

Section 10. Information/technology transfer

Information collected will be made available via Streamnet and informational reports will be available detailing project specifics. Site visits with government and private groups will be held and information will be presented at watershed, range and fisheries workshops.